Teachers' Perception of Vocal Quality Compared With Professional Perception

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Summary: Purpose. The purpose of this study was to investigate the difference in teachers' self-perception of their own voices compared with a voice clinician's perceptual assessment.
Methods. Participants included 45 elementary school (grades 1–8) teachers (34 females, 11 males) in public and private schools, with a mean age of 38.9 and age ranging from 24 to 65 years. The procedures included a demographic questionnaire, a self-assessment scale, and perceptual analysis.
Results. We found no difference when comparing overall vocal deviation of connected speech perceived by the teachers and the voice clinician ($P = 0.509$). However, the sustained vowel samples were perceived differently ($P = 0.015$). When comparing the teachers' and the voice clinician's perception of vocal qualities in both the vowel and the connected speech samples, we observed that they perceive roughness ($P < 0.001$ for both samples) and strain ($P = 0.005$ for vowel and $P = 0.019$ for connected speech) differently; however, breathiness is perceived similarly for both the vowel and the connected speech samples ($P = 0.591$ for vowel and $P = 0.134$ for connected speech). Increase in the numbers of years teaching showed a significant correlation with increase in teachers' perception of frequency of overall deviation (r = .870; $P < 0.001$). Additionally, increase in number of students in class was associated with increase in teachers' perception of frequency of strain (r = .819) ($P < 0.001$).
Conclusion. The findings indicate that the teachers' perception corresponds partially with the clinician's perceptual analysis. A similar impression about the voice deviation was found only when comparing the perceptual analysis of connected speech.
Key Words: voice disorders–voice perception–professional voice use–vocal quality perception–perceptual analysis.

INTRODUCTION

Past research has found that teachers, compared with nonteachers, were significantly more likely to have experienced multiple voice symptoms/signs such as hoarseness, discomfort, and increased effort while using their voice; tiring or change in voice quality after short use; difficulty projecting their voice; trouble speaking or singing softly; and a loss of their singing range.[1–3] Additional research showed that teachers are at a higher risk of experiencing voice disorders when compared with the general population.[4–7] A significant study, whose participants included 1243 and 1288 randomly selected teachers and nonteachers, respectively, examined the prevalence of voice disorders in teaching *versus* nonteaching populations.[8] Teachers and nonteachers alike completed a voice perception questionnaire. Analysis of the questionnaire showed that significantly more teachers (11%) reported a current voice disorder compared with nonteachers (6.2%). This high prevalence is likely because of intense and prolonged occupational voice use, speaking in a noisy environment, and inefficient phonation techniques.

These findings have implications as vocal dysfunction leads to a lower quality of teaching, an increase in absenteeism, and a major financial burden. Serious personal and emotional consequences may also result for the individual teacher. Teachers feel limited in their current job performance and in their future job or career options because of their voice problems.[8] Research indicates that only 13.5% of teachers reported receiving information about vocal hygiene during their education, highlighting the lack of education and awareness about optimal vocal use among teachers.[9]

It is important to note that a recent study conducted on 289 Jordanian teachers examined teachers' perception of their voice-related quality of life *via* the Voice Handicap Index Arab. This study revealed that teachers with dysphonia are aware of the impact of their voice problem on their quality of life.[10] However, little is known in regards to the awareness a teacher without voice complaint has of his/her vocal quality.[11] An additional study examined patients' vocal assessment to clinicians' vocal evaluation. Results from that study found that there is an indirect correlation between the clinician's perception and the patient's perception. However, the said study did not focus on teachers' perception compared with the clinical perception.[12]

Although it has been established that teachers have a higher prevalence of voice disorders than nonteachers, no studies have examined the difference between teacher and professional perceptual analysis of voice. Therefore, the present study was conducted to assess whether teachers are self-aware of their vocal quality, and to examine whether there is a difference between teachers' perception of their voice quality compared with a voice clinician's perception. This will have implications for determining the need for education and awareness of vocal hygiene and optimal voice use among teachers.

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METHODS

Population

Participants included 45 school teachers (grades 1–8), 34 females and 11 males. Their mean age was 38.9 years with a range of 24–65 years. They were from public and private schools in New York and New Jersey. Teachers included in the study were those who were teaching in elementary school (grades 1–8), and who had a minimum of 2 years of teaching experience. Teachers did not have any present reported voice disorder and/ or were not currently enrolled in voice therapy or had undergone voice therapy in the past.

Procedures

A questionnaire containing 12 questions was administered in person to the individuals. The questionnaire included questions about demographic information, teaching experience, past and present medical history, and past vocal history. After completing the questionnaire, all participants were given a voice assessment rating scale. The voice assessment rating scale instructed the participants to rate the following statement "I feel my voice is (poor, fair, good, very good, excellent)" as well as the frequency and the severity of vocal qualities (roughness, breathiness, and strain) based on the following statements: (1); (2) I think my voice is hoarse; (3) I feel as though I have to strain to produce voice; and (4) I feel as though air is escaping as I speak. Frequency was rated from 0 (never) to 4 (all the time) and severity was rated from 0 (none) to 3 (severe). In addition, participants also rated the following statement "I feel my voice is" on a four-point scale ranging from 0 (poor) to 3 (excellent). Participants based their self-evaluation on the impression they had about their vocal quality. It is important to highlight that the participants were not presented with the technical terminology for vocal qualities, instead they were presented with layman sentences describing the vocal qualities.

For the perceptual analysis, voice samples were obtained in a quiet room. Participants sustained the "ah" vowel sound and read the first sentence of the Rainbow Passage. Samples were recorded with a unidirectional condenser microphone (iRig Mic, IK Multimedia Production, Modena, Italy) connected to an iPad (3rd generation, Apple Inc., United States). These two productions were later perceptually analyzed by a voice clinician with more than 10 years of experience in voice and perceptual analysis who rated the severity of the overall deviation of each participant on a scale of 0 (no deviation) to 3 (extreme deviation) and indicated the predominant vocal quality for the voice samples: roughness, breathiness, and strain. Voice samples were presented *via* headphones and the listener listened to the samples up to three times.

For the purpose of checking the listener's reliability, 20% of the samples were repeated. The listener was reliable in this task, presenting with a high intraclass correlation coefficient (r = 0.828).

Statistical analyses

Descriptive statistical analyses were used for clinical and demographic information: age, and the presence and severity of voice deviation as perceived by teachers and the voice clinician. The Wilcoxon signed rank test was used to compare the perception of the teachers and the voice clinician based on the speech task (vowel and connected speech) for overall deviation, roughness, strain, and breathiness. The Friedman test was used to compare the scores of vocal qualities perceived by the clinician according to the speech task. The Spearman rank correlation coefficient was used to check the degree of associations among the various variables. A statistical significance of 0.05 (5%) was considered for all the analyses.

RESULTS

Table 1 shows means and standard deviations of overall severity of vocal quality, hoarseness, strain, and breathiness according to the clinician evaluation and the teacher's self-assessment.

The mean frequency of vocal qualities perceived by teachers for overall voice deviation was .84 (SD = .85), for roughness 1.09 (SD = .82), for strain .71 (SD = .79), and for breathiness .42 (SD = .66). The mean severity of vocal symptoms perceived by teachers was "mild" for overall deviation (mean = .64, SD = .77), roughness (mean = .87, SD = .76), strain (mean = .58, SD = .75), and "none" for breathiness (mean = .27, SD = .58).

The mean severity of vocal qualities rated by the voice clinician for the vowel samples (Figure 1) was "mild" (mean = .73, SD = .62) for overall deviation and "none" for roughness (mean = .31, SD = .47), strain (mean = .24, SD = .43), and breathiness (mean = .11, SD = .32). No statistical significances were observed between hoarseness, strain, and breathiness for the vowel sample and the Rainbow Passage. The mean severity of vocal qualities rated by the voice clinician for the Rainbow Passage (Figure 2) was "mild" for overall deviation (mean = .73, SD = .62) and "none" for roughness (mean = .31, SD = .47), strain (mean = .24, SD = .43), and breathiness (mean = .11, SD = .32).

When comparing vocal qualities perceived by the teachers and the voice clinician, we observed no statistical significance ($P = 0.509$) for the overall deviation for connected speech. However, a statistically significant difference ($P = 0.015$) was observed for overall deviation for the vowel samples.

Statistically significant differences were observed when comparing the teachers' and the voice clinician's perception of vocal qualities in the vowel and in the connected speech samples for roughness ($P < 0.001$ for both samples) and strain ($P = 0.005$ for vowel and $P = 0.019$ for connected speech). No statistical significance was found between the teachers' and the voice clinician's perception of breathiness for both the vowel and the connected speech samples ($P = 0.591$ for vowel and $P = 0.134$ for the Rainbow Passage).

No statistical significance was found within the clinician's perception of the vocal qualities in the vowel ($P = 0.462$) and connected speech ($P = 0.122$) samples (Figure 3). However, a statistically significant result ($P < 0.001$) was found between mean frequency of teachers' perception of vocal qualities.

We found overall weak correlations when looking into correlations among the variables studied (Table 2): reported vocal history and teachers' perception of frequency of hoarseness (r = .320) ($P = 0.031$) and strain (r = .330) ($P = 0.025$); age of students and the voice clinician's perception of overall deviation (r = .306) ($P = 0.039$) and hoarseness (r = .339) ($P = 0.023$) in the vowel samples; and number of years teaching and teachers'